The NRCS and Energy

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Legislative Basis

- 2008 Farm Bill
- 2007 Energy Security Act

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2008 Farm Bill

- Conservation Title (II):
  - CSP will cover more acres. Energy enhancements are still viable options.
  - EQIP purposes are expanded to include forestry management and energy conservation.
- Energy Title (IX):
  - Biomass Crop Assistance Program - NRCS technical assistance may be required

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2007 Energy Security Act

- Biofuels Title (II):
  - Renewable Fuel Standard includes “advanced biofuels” production requirements.
  - Lifecycle reduction in GHG emissions includes feedstock production practices
- Energy Savings in Government (Titles III & IV):
  - Require government purchase and lease of energy efficient buildings and equipment

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2007 Energy Security Act (cont'd)

Overall Goal:

25% of the total energy consumed in the United States will be produced from U.S. Agriculture, forestry and working lands without compromising safe, abundant and affordable food, feed and fiber.

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NRCS Energy Emphasis

- 2005-2010 Strategic Plan
- Energy Action Plan
- BBCC
- Programs
- Air Quality, Climate Change and Energy (ACE) coordination efforts

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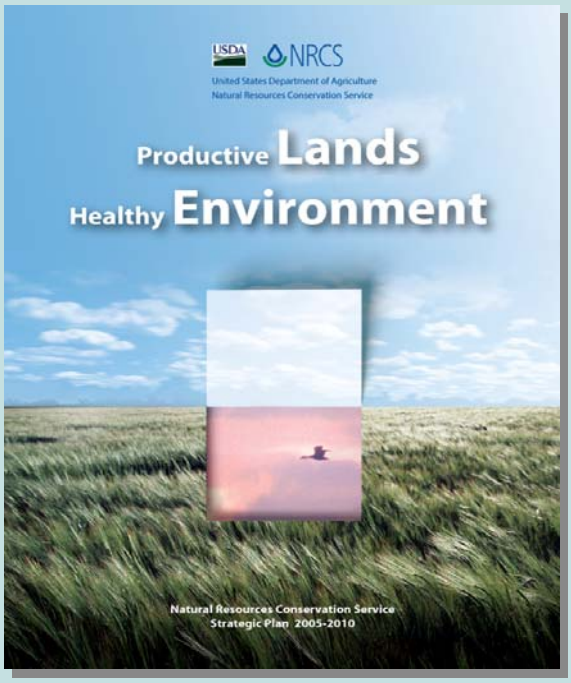

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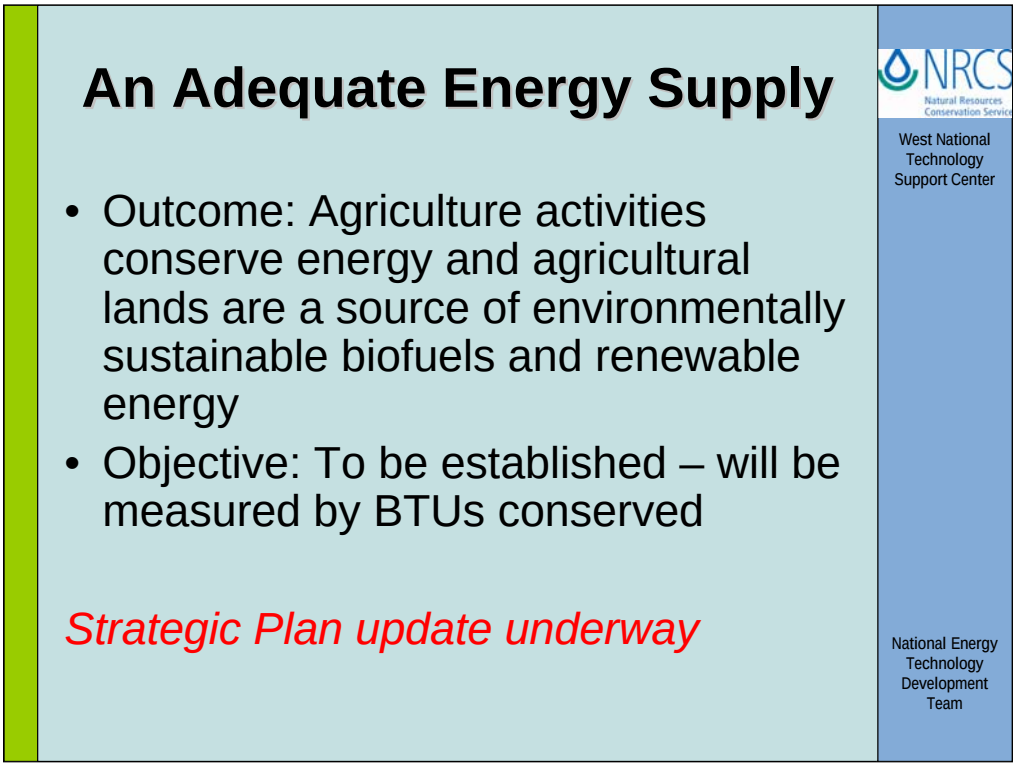
And we have three “Venture Goals” that describe areas where we anticipate the need for greatly expanded activity in the future:

- Clean Air
- An Adequate Energy Supply
- Working Farms and Ranches



For our goal of An Adequate Energy Supply, we define an outcome of .....

Our objective is to be established.

To encourage farmers to maximize fuel efficiency and produce environmentally sustainable renewable energy sources, NRCS will:

Integrate energy-related resource concerns into our planning and technical consultation assistance, technology development, and financial assistance programs;

Cooperate in the development of information and technology to promote energy management

Integrate energy concerns into our planning assistance programs; and

Encourage increased use of biofuels.

Baseline: To be determined. NRCS currently is evaluating several methods on how to best evaluate fuel savings.

Who is Working on Energy Issues?

- **Energy Technology Development Team***
- Science and Technology Divisions
  - RESSD
  - ESD
  - ENG
- Programs
- Watersheds
- Soil Science and Resource Assessment
- Strategic Planning
- Public Affairs
- States - Energy Contacts

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NRCS Energy Management Initiative Implementation Plan

(Energy Action Plan - Draft)

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Seven Broad Goals

1. Identify and communicate NRCS' energy role.
2. Integrate energy concerns into NRCS planning process.
3. Develop tools and technologies to support energy management.
4. Provide training to NRCS field and state office personnel.

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Seven Goals (continued)

5. Develop partnerships.
6. Save energy within NRCS operations.
7. Develop technologies and provide information for sustainable biomass energy production.

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BBCC: USDA Energy Matrix

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The Conservation Security Program (CSP)

- Energy Audits
- Renewable Energy Production for On-Farm Use
- Recycling Farm Equipment Lubricants

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•Under CSP these activities are conducted through **enhancement payments**

- •They are subject to payment caps
- •Depend on the CSP tier level
- •Land area affected
- •And the number of activities a producer undertakes

•**Energy Audits**

- •At a minimum must identify baseline usage for non-residential structures and all stationary equipment used in farming operations. Vehicles and the farmstead are currently excluded.
- •Must hire a professionally qualified energy auditor or utility or
- •Can do a baseline self assessment using a worksheet that we developed. The excel worksheet estimates energy usage for grain drying, irrigation, greenhouses, pork, poultry, and dairy. Payments are not made for the baseline energy self assessment only for those conservation measures implemented as a consequence of conducting the baseline assessment.
- •A one-time payment of $500 is offered for a professionally derived audit

•**Reducing Energy Consumption**

- •Amount of payment is based on either 5, 10, or 20 percent reduction in energy usage consumed by stationary equipment . It is measured using BTUs.
- •A baseline energy audit must be done before claiming this enhancement.

•**Recycling Farm Equipment Lubricants**

- •Offers an annual payment to producers who recycle all their farm lubricants

EQIP: Conservation Innovation Grants (CIG) Examples

- Solar greenhouse (New Mexico)
- Solar irrigation system (Georgia)
- Solar and wind powered water pumping systems (Wyoming)
- Web-based energy self-assessment tool (Wisconsin)
- Biofuels acceleration project – woody species (Iowa, Missouri)

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Environmental Quality Incentives Program (EQIP)

Financial assistance TBD, but likely a major undertaking involving new practices, tools

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Air Quality, Climate Change and Energy Coordination Plan Proposals:

- Improve communications among NHQ divisions
- Establish ACE position on Core Team at NTSC's
- Develop reporting system that supports ACE
- Develop integrated training*

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What we do:

- Support State Energy Contacts (web meetings)
- Support Programs (CSP, CIG)
- Support Science and Technology (reviews, FOTG, Congressional responses, networking)
- Support Strategic Planning (measurements)
- Develop Energy Tools
- Distribute energy information (tech notes, fact sheets)
- **Provide Training*** (web-based and classroom)

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Resource Concern	Description of Concern
Energy Use	**Inefficient use of all types of energy leads to reduction in global energy resource supplies.**
Renewable Energy Potential	**Excessive use and reliance on fossil based fuels pose negative environmental impacts and threats to national security. Renewable energy alleviates many of these concerns.**

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Conservation Practices With Strong Links to Energy Conservation

- Residue Management
- Irrigation Water Management
- Nutrient Management
- Pesticide Management
- Drainage Water Management
- Rotational Grazing

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Residue Management

Residue Management Seasonal	Converting from this practice to Mulch-till or No-till/Strip till/Direct Seed, could save energy.
Residue and Tillage Management Ridge Till	This practice involves intense tillage during one part of the year only and, compared with conventional till can save up to 20% in fuel by reducing the number of passes with machinery.
Residue and Tillage Management Mulch Till	This practice generally involves fewer passes over the field and, compared with conventional till can save up to 20% in fuel .
Residue and tillage Management No till/Strip till/Direct seed	This practice involves minimal soil disturbance. Energy savings over conventional till is significant, but can vary depending on the actual practice. Fuel savings can be over 50%. This practice standard requires a STIR rating of less than 20, but a lower STIR is possible. A lower STIR rating will generally use less energy.

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Nutrient Management

Nutrient Management	**This practice requires accounting of all sources of nutrients when determining how much nitrogen to apply to a crop, so if manure or legumes are used, correct implementation of this practice should result in reduced nitrogen use. The practice also requires using the appropriate form, timing, rate and placement of nutrients to supply crop needs. Precision farming (placement, timing and rate based on site-specific analyses) should provide significant energy savings, also.**
Cover Crop	**When the purpose of the cover crop is to promote biological nitrogen fixation or capture and recycle nutrients, resulting in a lower nitrogen requirement, energy associated with the nitrogen fertilizer can be saved. The cover crop should be a nitrogen-fixing legume for the greatest energy benefit. Planting cover crops requires additional energy, however.**
Conservation Crop Rotation	**If the conservation crop rotation includes a perennial crop, significant energy can be saved by not preparing the seedbed and planting each year. If the rotation includes a legume crop, especially a perennial legume, additional energy can be saved by the reduced need for nitrogen fertilizer in the subsequent crop.**
Waste Utilization (?)	**If manure is considered "free" nitrogen, energy that would have gone into nitrogen fertilizer can be saved by spreading manure on the crop fields. However, manure spreading is an energy intensive operation, and is more intensive when manure must be hauled to distant fields.**

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Irrigation	
Irrigation Water Management	**Implementing this practice should apply the rate, volume, and frequency of irrigation water in a manner that uses water efficiently. Efficient use of water will optimize pumping requirements and often (though not always) result in reduced water use.**
Pumping Plant	**Installing a pumping plant according to the practice will ensure that the pump size and pressure meet the needs of the irrigation system. A Pumping Plant Evaluation of an existing pumping plant will determine if the existing plant meets the current needs of the irrigation system and recommend changes needed to make the pumping plant more energy efficient.**
Sprinkler Irrigation	**Converting from high pressure sprinkler irrigation to low pressure sprinkler irrigation will significantly reduce energy requirements for the system. This will involve changing nozzles, and adjusting pumping pressures.**
Tailwater Recovery	**Tailwater recovery generally reduces pumping requirements, because the tailwater usually doesn't need to be pumped as far as the original irrigation water. This system also saves fresh water.**
Pipeline	**This practice requires that irrigation pipelines be sized to meet the economic needs of the client. Undersized pipelines will require extra pressure to compensate for friction losses in the system. Increasing pipe size, while initially more costly, can save a significant amount of energy in the long-term.**

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•27 million acres are under sprinkler irrigation.

•80 % of these acres use center pivot systems.

•Converting from medium-pressure to low-pressure systems could save about $9.00 per acre.

•Converting from high-pressure to low-pressure systems could save up to $41 per acre.

Grazing Management

Prescribed Grazing	**This practice, compared with a confined system, significantly reduces energy costs associated with animal production by reducing planting, harvest and feed storage costs. It promotes economic stability and reduces energy costs through managed field grazing and direct feeding of animals.**
Pumping Plant	**Installation of an alternative source of power for water pumping. This may include wind or solar applications. These projects may eliminate the need to cross a field with an electric distribution line. Note; This practice is also listed under irrigation.**
Watering Facility/Fence	**These practices facilitate Prescribed Grazing, enabling greater grazing efficiency.**
Silvopasture	**Planned planting, growth and harvesting of woody plants and shrubs for biomass development. Harvesting will be planned for as an enhancement to forest growth and fire protection. Fuel can be harvested as firewood, slash, or chips.**
Stream Crossing	**If you construct a stream crossing that gets you from point A to point B by traveling less distance you will save energy.**
Spring Development	**Springs are gravity fed therefore pumping costs are avoided and energy is conserved.**
Brush Management	**Designed to remove or reduce non-herbaceous plants, this practice allows for mechanical, chemical, biological, prescribed burning, or any combination to accomplish the task. Mechanical involved energy use, chemical potentially alters the soil, and prescribed burning is usually detrimental to the air. However allowing a grazing animal to reduce this growth is a possibility. Timing, duration, and intensity are considerations.**

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Waste Management		
Waste Facility Cover	Although not applicable to every application, this practice lends itself to capture and use of biogas as an energy source. The practice already incorporates this component.	NRCS Natural Resources Conservation Service West National Technology Support Center
Waste Utilization	Like the above, this practice standard also allows for wastes to be utilized as an energy source if conditions are deemed favorable.	
Solid Liquid Waste Separation	The primary reason, in our opinion, to implement this practice standard is to conserve energy. The more efficient the separator -- the more energy saved.	
Manure Transfer	Like the practice standard above one of the primary objectives in the transfer of manure should be the conservation of energy or energy efficiency.	
Anaerobic Digesters- Ambient and Controlled Temperature	Both practices include a purpose to capture biogas for energy production. What is not mentioned is that these types of operations can be very energy intensive so efficiencies of operations should also be considered as well. Also, to save energy, the biogas energy produced would need to be used, rather than just burned off.	National Energy Technology Development Team
Composting	Two objectives for composting are to reduce the amount of wastes and provide an alternate source of nutrients – both of which can conserve energy.	

Energy Interim Practice Standards

- Colorado's Conservation Power Plant – Wind and photovolatic power plants
- Utah's Renewable Resource Energy Production - In addition to wind and photovoltaic includes hydropower and biogas as well
- Puerto Rico's Reduced Water and Energy Coffee Conveyance System – A mechanical device to process green manure coffee berries with reduced water and energy inputs
- Oregon's draft Energy Efficiency Standards

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Energy Audit Standard

- Industry standard rather than NRCS practice standard
- Sponsored by ASABE
- “Modular” audit
- Completion goal: 2009

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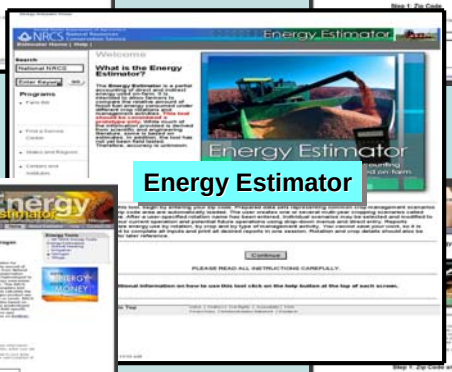
Energy Web Tools

Tillage

Irrigation



Energy Estimator

Nitrogen

Animal Housing

http://www.nrcs.usda.gov/technical/energy/index.html

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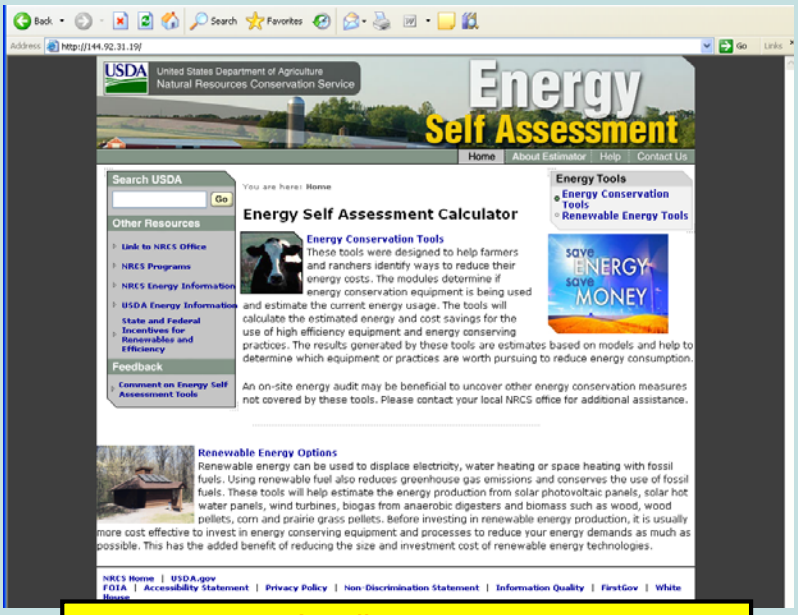
Energy Self Assessment



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In the future energy is likely to play a more prominent role in what we do than it has in the past.
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